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OPERATIONAL NOTE 1989 01 1989 10 17

THE NORTH AMERICAN SUGAR MAPLE DECLINE PROJECT

Submitted by:

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During the late fall - winter of 1987 under the auspices of Forestry Canada, the Province of New Brunswick was asked to participate in a project to examine maple decline and the possible influences of atmospheric pollution. The Department of Environment and the Department of Natural Resources and Energy became co-participants. The project, called "The North American Sugar Maple Decline Project" encompasses four provinces and 7 states.

OBJECTIVES

The main objective of the project is to determine the rate of change in sugar maple tree condition ratings during the 3 years of data collections. Other objectives are:

- To determine if the measured rate of change in sugar maple tree condition is related to:

  a) Various levels of pollution

  b) Managed sugarbush versus undisturbed stands and

  c) Various levels of initial stand decline conditions.

- To determine the possible causes of sugar maple decline and

- The geographical relationships between causes and the extent of decline.

Supplementary plots were established in the St. Quentin-Kedgwick area during the 1989 field season using the same basic experimental design methods. However, these plots will be interpreted only by the New Brunswick group.

RESULTS AND DISCUSSION

Tables 1, 2, 3, and 4 summarize the results from the 1988 field season as prepared by the State University of New York in an interim report, "Summary Progress Report of Data Management and Analysis for the North American Sugar Maple Decline Project, New Brunswick/Nova Scotia, August 25, 1989."

As expected, the sugarbushes studied in New Brunswick and Nova Scotia had fewer trees per hectare that did non-sugarbushes (612 and 719 respectively), and they had a higher percentage of sugar maple (72% and 63% respectively). The most prevalent species other than sugar maple was beech (Fagus grandifolia, Ehrh.). Average DBH was approximately 20 cm in both management types.

The majority of the dominant and codominant sugar maple trees, 94% in sugarbushes and 99% in non-sugarbushes, were rated as having no more than 10% dieback. Three of 543 dominant and codominant sugar maple trees in sugarbushes and one of 297 trees in non-sugarbushes were rated as having more than 50% dieback. Two of these four trees were also rated as having growth impairing defects.

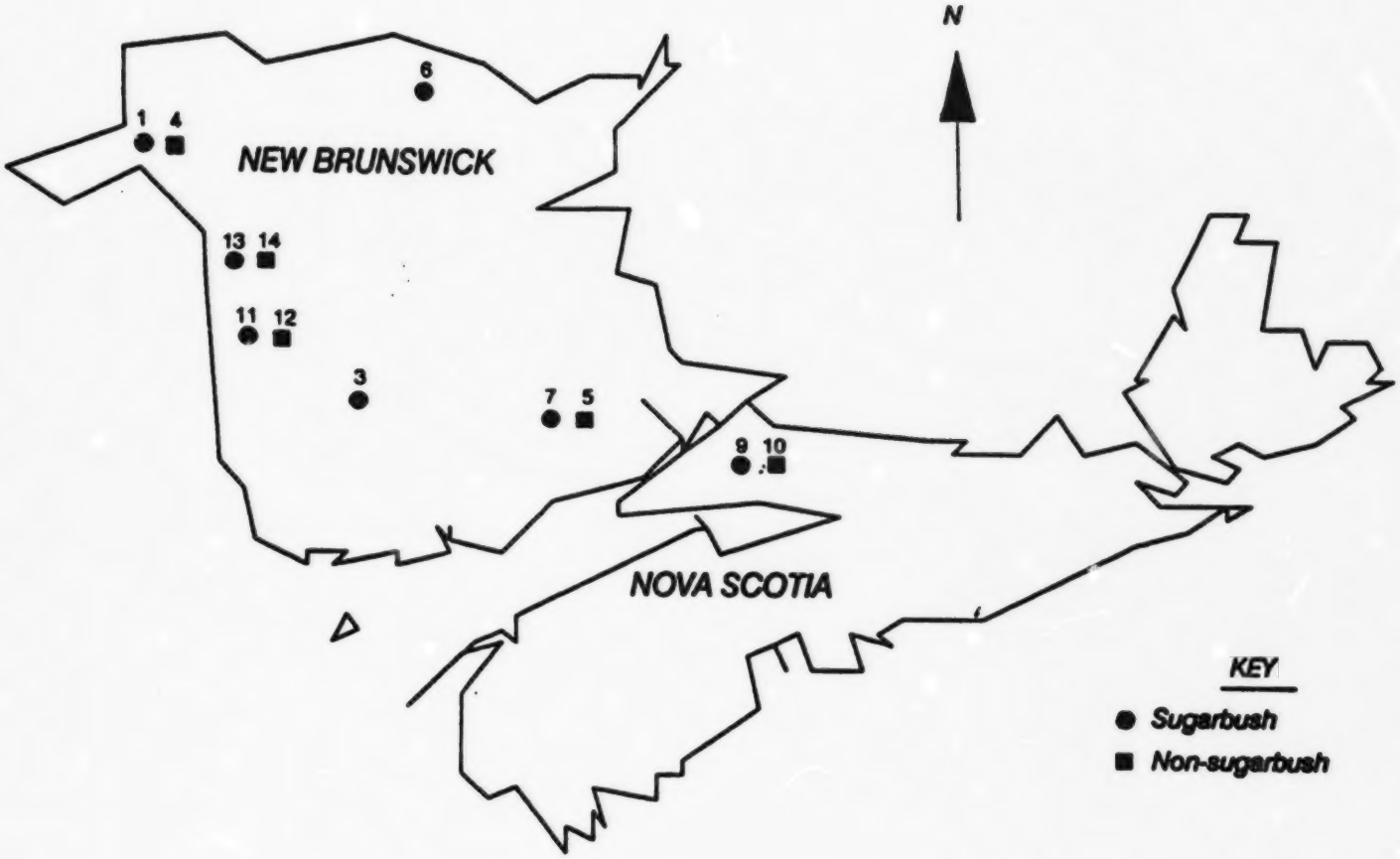

Fig. 1 - Approximate locations of New Brunswick/Nova Scotia NAMP stands.

Table 3. Summary of New Brunswick/Nova Scotia NAMP stand data.

Cluster #	Name	Mgt Type	Avg. Temperature (deg C) Ann.	Min.	Max.	Avg. Precip. (mm) Ann.	Summer	Logging	Forest Type	Grazing	Tapping	Tapping Method	Crown Clos.	Crown Struc.	Site Qual.
6	Bathurst	SB	3.9	-40.6	39.4	989	325	Old	Same	No signs	Current	Gr. tube	Open	One-story	Avg.
1	Lac Baker	SB	3.8	-38.3	36.1	1,121	387	Current	Same	No signs	Current	Gr. tube	Mod.	One-story	Avg.
4	Lac Baker	NSB	3.8	-38.3	36.1	1,121	387	Old	Same	No signs	None		Mod.	Two-story	Avg.
13	New Denmark	SB	4.0	-43.9	37.2	1,074	378	Recent	Same	No signs	Current	Gr. tube	Full	One-story	Avg.
14	New Denmark	NSB	4.0	-43.9	37.2	1,074	378	Old	Same	No signs	None		Full	Two-story	Avg.
3	Williamsburg	SB	5.4	-37.2	37.2	1,109	344	Never	Same	No signs	Current	Gr. tube	Mod.	One-story	Worse
11	Bristol	SB	4.0	-43.9	37.2	1,074	378	Old	Same	No signs	Current	Gr. tube	Full	Two-story	Avg.
12	Bristol	NSB	4.0	-43.9	37.2	1,074	378	Old	Same	No signs	None		Full	Multi-story	Avg.
7	Albert	SB	5.4	-44.4	37.2	1,063	312	Old	Same	No signs	Current	Gr. tube	Full	Two-story	Avg.
5	Albert	NSB	5.4	-44.4	37.2	1,063	312	Old	Same	No signs	None		Full	Multi-story	Avg.
9	Amherst(NS)	SB	5.5	-37.8	36.7	1,095	344	Old	Same	No signs	Current	Gr. tube	Full	Two-story	Better
10	Sweeney(NS)	NSB	5.5	-37.8	36.7	1,095	344	Old	Same	No signs	None		Full	Two-story	Better

Table 4. Summary of New Brunswick/Nova Scotia NAMP crown condition ratings.

Cluster #	Name	Mgt Type	% of Live Sugar Maple in Dieback Classes n	0-5%	0-10%	>50%	% of Live Sugar Maple in Vigor Classes n	1	1&2	4	% Sugar Maple	Rel. Density
6	Bathurst	SB	40	67.5	92.5	2.5	40	60.0	92.5	2.5	84	56.20
1	Lac Baker	SB	68	54.4	94.1	0.0	67	58.2	97.0	0.0	93	56.80
4	Lac Baker	NSB	50	56.0	94.0	0.0	48	56.3	95.8	0.0	51	88.90
13	New Denmark	SB	108	91.6	99.1	0.9	106	75.5	98.1	0.9	76	87.80
14	New Denmark	NSB	45	91.1	100.0	0.0	47	57.5	100.0	0.0	34	132.80
3	Williamsburg	SB	64	40.6	79.7	1.6	64	46.9	90.6	1.6	46	118.10
11	Bristol	SB	91	83.5	96.7	0.0	90	80.0	96.7	0.0	80	106.10
12	Bristol	NSB	52	84.6	98.1	0.0	49	73.5	98.0	0.0	50	92.90
7	Albert	SB	76	57.9	90.8	0.0	74	52.7	87.8	1.4	62	132.90
5	Albert	NSB	81	74.1	95.1	1.2	79	62.0	94.9	1.3	75	122.90
9	Amherst(NS)	SB	97	95.9	100.0	0.0	96	94.8	100.0	0.0	83	100.70
10	Sweeney(NS)	NSB	169	94.7	100.0	0.0	169	92.3	100.0	0.0	94	123.90
Management												
	Sugarbush		543	73.9	94.3	0.5	537	69.8	95.3	0.7	72	
	Non-sugarbush		397	83.9	98.0	0.3	392	75.3	98.2	0.3	63	
All Clusters			940	78.1	95.9	0.4	929	72.1	96.6	0.5	68	